

**CLAIMS**

What is claimed is:

- 1 1. A packet optimization method comprising:
  - 2 generating a metric to indicate a channel condition;
  - 3 processing the metric to determine optimal packet-size for the channel
  - 4 condition; and
  - 5 choosing the optimal packet-size corresponding to the processed metric to
  - 6 send to a requestor.
  
- 1 2. The packet optimization method of claim 1, wherein processing further
- 2 includes:
  - 3 receiving the metric corresponding to the channel condition; and
  - 4 using the received metric to balance a trade-off between the cyclic
  - 5 redundancy check and re-transmission overhead.
  
- 1 3. The packet optimization method of claim 1, wherein choosing the optimal
- 2 packet further includes training a neural network or look-up table to optimally
- 3 improve system data throughput by selecting a packet corresponding to the
- 4 channel condition.
  
- 1 4. The packet optimization method of claim 1, wherein the optimal packet-
- 2 size being a packet-size that minimizes both cyclic redundancy check and re-
- 3 transmission overhead.
  
- 1 5. The packet optimization method of claim 1, wherein the metric being a
- 2 frame error rate
  
- 1 6. The packet optimization method of claim 1, wherein the metric being a
- 2 function of a packet error rate selected from a group consisting of frame error

3 rate (FER), signal to noise ratio estimate (SNR), energy per bit (Eb) / Thermal  
4 noise (Nt) estimate, and system time or finger time drift rate.

1 7. An apparatus comprising:  
2 a memory to store a metric and packet; and  
3 a processor to generate a metric indicating a channel condition, to process  
4 the metric to determine optimal packet-size for the channel condition, and to  
5 choose the optimal packet-size corresponding to the processed metric to send to  
6 a requestor.

1 8. The apparatus of claim 7, wherein the processor is to receive the metric  
2 corresponding to the channel condition, and use the received metric to balance  
3 trade-off between the cyclic redundancy check and re-transmission overhead.

1 9. The apparatus of claim 7, wherein the processor is to train a neural network  
2 or look-up table to optimally improve system data throughput by selecting a  
3 packet corresponding to the channel condition.

1 10. The apparatus of claim 7, wherein the processor is to choose an optimal  
2 packet-size that minimizes both cyclic redundancy check and re-transmission  
3 overhead.

1 11. The apparatus of claim 7, wherein the processor is to use the metric  
2 corresponding to frame error rate

1 12. The apparatus of claim 7, wherein the metric being a function of a packet  
2 error rate selected from a group consisting of frame error rate (FER), signal to  
3 noise ratio estimate (SNR), energy per bit (Eb) / Thermal noise (Nt) estimate,  
4 and system time or finger time drift rate.

1       13. A storage medium having stored therein a plurality of machine executable  
2       instructions, wherein when executed, the instructions perform a method  
3       comprising:

4           generating a metric to indicate a channel condition;

5           processing the metric to determine optimal packet-size for the channel  
6       condition; and

7           choosing the optimal packet-size corresponding to the processed metric to  
8       send to a requestor.

1       14. The storage medium of claim 13, wherein processing further includes:

2           receiving the metric corresponding to the channel condition; and

3           using the received metric to balance trade-off between the cyclic  
4       redundancy check and re-transmission overhead.

1       15. The storage medium of claim 13, wherein choosing the optimal packet  
2       further includes training a neural network or look-up table to optimally improve  
3       system data throughput by selecting a packet corresponding to the channel  
4       condition.

1       16. A method of preventing system overload in a base station or mobile data  
2       transmission system comprising:

3           estimating likelihood of packet transmission error in a system;

4           determining a radio link protocol (RLP) packet-size corresponding to the  
5       estimated likelihood of packet transmission error; and

6           sending the RLP packet to a base station or mobile data transmission  
7       system.

1       17. The method of claim 16, wherein determining the RLP packet-size further  
2       includes:

3           allowing a base station or mobile data transmission system to request a  
4       change for the RLP packet-size;

5           selecting a RLP packet from a predetermined table that corresponds in size  
6       to the size requested by the base station or mobile data transmission system; and  
7           sending the selected RLP packet to the base station or mobile data  
8       transmission system.

1     18. The method of claim 17, wherein the base station or mobile data  
2       transmission request being limited to a predetermined number of requests.

1     19. An apparatus comprising:  
2           a memory to store an RLP packet; and  
3           a processor to estimate likelihood of packet transmission error in a system,  
4       to determine a radio link protocol (RLP) packet-size corresponding to the  
5       estimated likelihood of packet transmission error, and to send the RLP packet to  
6       a base station or mobile data transmission system.

1     1     20. The apparatus of claim 19, wherein the processor is to allow a base station  
2       or mobile data transmission system to request a change for the RLP packet-size,  
3       to select a RLP packet from a predetermined table that corresponds in size to the  
4       size requested by the base station or mobile data transmission system, and to  
5       send the selected RLP packet to the base station or mobile data transmission  
6       system.

1     1     21. The apparatus of claim 20, wherein the processor is to limit the request  
2       from the base station or mobile data transmission to a predetermined number of  
3       requests.

1     1     22. A storage medium having stored therein a plurality of machine executable  
2       instructions, wherein when executed, the instructions perform a method  
3       comprising:  
4           estimating likelihood of packet transmission error in a system;

5           determining a radio link protocol (RLP) packet-size corresponding to the  
6       estimated likelihood of packet transmission error; and  
7           sending the RLP packet to a base station or mobile data transmission  
8       system.

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1       23. The storage medium of claim 22, wherein determining the RLP packet-size  
2       further includes:

3           allowing a base station or mobile data transmission system to request a  
4       change for the RLP packet-size;  
5           selecting a RLP packet from a predetermined table that corresponds in size  
6       to the size requested by the base station or mobile data transmission system; and  
7           sending the selected RLP packet to the base station or mobile data  
8       transmission system.

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1       24. The storage medium of claim 22, wherein the base station or mobile data  
2       transmission request being limited to a predetermined number of requests.

1       25. A method of optimizing packet-size comprising:  
2           storing at least one radio link protocol (RLP) packet in a physical layer; and  
3           predetermining the RLP packet-size by empirical experimentation.

1       26. The method of claim 25, wherein the empirical experimentation includes  
2           simulating a condition with a particular metric value;  
3           adjusting packet-size manually corresponding to the metric value; and  
4           recording packet-size data for the metric value to obtain maximum system  
5       throughput.

1       27. The method of claim 25, wherein the predetermining further includes  
2           storing a metric value in a lookup table and obtaining an optimum packet-size  
3       corresponding to the stored metric value.

1       28. The method of claim 25, wherein the RLP packet includes cyclic  
2       redundancy check bits to provide error-checking capability for the RLP packet.

1       29. An apparatus comprising:  
2              a memory to store an radio link protocol (RLP) packet, and empirical  
3              experimentation data;  
4              a processor to store at least one RLP packet in a physical layer, and to  
5              predetermine the RLP packet-size by empirical experimentation.

1       30. The apparatus of claim 29, wherein the processor to perform empirical  
2       experimentation is to simulate a condition with a particular metric value, to  
3       adjust packet-size manually corresponding to the metric value, and to record  
4       packet-size data for the metric value for obtaining maximum system throughput.

1       31. The apparatus of claim 29, wherein the processor is to store a metric value  
2       in a lookup table and is to obtain an optimum packet-size corresponding to the  
3       stored metric value.

1       32. The apparatus of claim 29, wherein the RLP packet includes cyclic  
2       redundancy check bits to provide error-checking capability for the RLP packet.

1       33. A storage medium having stored therein a plurality of machine executable  
2       instructions, wherein when executed, the instructions perform a method  
3       comprising:  
4              storing at least one radio link protocol (RLP) packet in a physical layer; and  
5              predetermining the RLP packet-size by empirical experimentation.

1       34. The storage medium of claim 33, wherein the empirical experimentation  
2       includes  
3              simulating a condition with a particular metric value;  
4              adjusting packet-size manually corresponding to the metric value; and

5 recording packet-size data for the metric value to get maximum system  
6 throughput.

1 35. The storage medium of claim 33, wherein the predetermining further  
2 includes storing a metric value in a lookup table and obtaining an optimum  
3 packet-size corresponding to the stored metric value.

1 36. The storage medium of claim 33, wherein the RLP packet includes cyclic  
2 redundancy check bits to provide error-checking capability for the RLP packet.

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